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How To Support Students With Learning Differences - The Assistive Technology and Education Connection

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Setting the stage

What is the impact of increased educational standards on students with learning differences?

On a national level, educational performance standards, curriculum demands and graduation requirements are being increased. Students with learning differences or disabilities will be held to the same increased standards. They cannot be denied access to general education expectations or standardized testing and need to be provided with appropriate and reasonable services to maintain them. Without appropriate support and services, these students will frequently be at risk for grade retention, not be able to remain in general education, not be competitive for a degree (even a high school diploma) and become a statistic for "dropping out" or underachieving.

The role of education is to instruct students in a learning environment that will prepare them to meet prescribed academic standards and levels of achievement on examinations. As students graduate, they should have experienced a course of studies and activities that would prepare them for entry into the work force, entrance into college, dealing with some issues regarding independence and responsibility, and being a member of the community. We need to look for interventions to support students who have a history of learning problems, by possibly leveling the playing field, but not giving inappropriate advantages.

How can assistive technology help students with learning differences to succeed? As demands within general education increase, we have to look for alternative interventions to foster student success. In order to maximize success, an integrated approach involving instructional practices and applied assistive technology should be considered. The use of computers, related technologies, instructional modifications and learning strategies, in both the school and home settings, are major tools in addressing the educational needs of students with learning or attention difficulties. Overall, student goals are to increase independence, empowerment, self-esteem and participation in meeting the academic performance and assessment demands of the curriculum, in developing study/independent work strategies, and organization skills.

What is Assistive technology? It is important to examine what we mean by Assistive Technology, the types of students who may require the service and how it fits in with education. Assistive Technology devices and services can be the result of comprehensive evaluations, an ongoing process or extended assessment, with a goal to find an appropriate student technology match. Assistive Technology Devices and Services are defined by the following excerpts from the Individuals With Disabilities Education Act (IDEA), re-authorized in 1997:

Assistive Technology defined by the IDEA

SEC. 602. DEFINITIONS. Except as otherwise provided, as used in this Act:

ASSISTIVE TECHNOLOGY DEVICE - The term 'assistive technology device' means any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of a child with a

disability.

ASSISTIVE TECHNOLOGY SERVICE - The term 'assistive technology service' means any service that directly assists a child with a disability in the selection, acquisition, or use of an assistive technology device. Such term includes

(A) the evaluation of the needs of such child, including a functional evaluation of the child in the child's customary environment;

(B) purchasing, leasing, or otherwise providing for the acquisition of assistive technology devices by such child;

(C) selecting, designing, fitting, customizing, adapting, applying, maintaining, repairing, or replacing of assistive technology devices;

(D) coordinating and using other therapies, interventions, or services with assistive technology devices, such as those associated with existing education and rehabilitation plans and programs;

(E) training or technical assistance for such child, or, where appropriate, the family of such child; and (F) training or technical assistance for professionals (including individuals providing education and rehabilitation services), employers, or other individuals who provide services to, employ, or are otherwise substantially involved in the major life functions of such child.

Assistive Technology is also part of "SUPPLEMENTARY AIDS AND SERVICES" and defined as:

.(29) - The term 'supplementary aids and services' means aids, services, and other supports that are provided in regular education classes or other education-related settings to enable children with disabilities to be educated with nondisabled children to the maximum extent appropriate in accordance with section 612(a)(5)." (IDEA 97 's provision on least restrictive environment).

Who gets assistive technology?

Who gets referred and evaluated for assistive technology is a major concern for all parties the student, the parents, clinicians (including members of school based teams), teachers and administrators. Parents, educators and private practitioners are becoming more aware of the benefits of assistive technology, whereby referrals are increasing for school districts to consider Assistive Technology as an important tool to utilize for students with disabilities. Parents, educators and providers (private or school-based) can initiate a referral for assistive technology to be considered, as a means of addressing learning and school performance issues, for a student having learning difficulties. Support through computer access is an example of an Assistive Technology area for students who have difficulty writing legibly or keeping pace in terms of writing speed. Portable word processors or laptop computers with spellcheck features, are possible assistive technology devices being offered. Alternate input devices such as keyboards, trackballs and specialized software may also be necessary, depending on the extent of disabilities. In addition, talking text, word prediction software and screen readers are recommended when students present with learning disabilities in written language, spelling and reading comprehension that adversely impact on classroom performance. The area of augmentative communication provides assistance for students who are nonverbal or present with significant communication disorders.

When does it need to be considered?

According to the IDEA, last amended in 1997 every IEP (Individualized Education Program) meeting should consider if the student needs Assistive Technology. A major issue is if the student will be able to be successful, in relation to IEP objectives and goals, as well as with the expectations of the curriculum. If the students success is significantly hindered by his/her disabilities and if the current program is appropriate to meet his/her learning needs, then the utilization of assistive technology and/or a combination of supplementary aids and services should be considered.

Additional services, which will enable a student to engage in or perform many tasks, are an educational necessity. Individual Assistive Technology devices and services are usually part of a student's IEP.

What are some examples of assistive technology devices?

Word processors, devices that enlarge printed words on a computer screen, specialized mathematics software, electronic communication aids, speech synthesizers, scanners, computer text readers (Kurtzweil 3000, e-Reader, WYNN, Read & Write), Braille writers, tape recorders, spell check devices, augmentative communication devices, calculators, and prosthetic devices. Different input devices such as alternate keyboards, minikeyboards, keyguards, switches, voice recognition systems (dragon systems - naturally speaking, IBM via voice), joysticks, trackballs, touch pads, head mouse, infrared pointers, environmental controls and touch windows. The Federal Government acknowledges " that for all individuals, technology can provide important tools for making the performance of tasks quicker and easier, but for some individuals with disabilities, assistive technology is a necessity that enables them to engage in or perform many tasks".

What populations can benefit from assistive technology?

Students with learning differences in relation to all aspects of the curriculum - be they related to the input, processing or output of information can benefit from assistive technology. Assistive technology can be provided in general education with supportive services or special class settings. Students may present with physical limitations and / or learning issues that require nontraditional approaches to instruction and learning. Students with learning differences represent a wide range of problem areas - learning disabilities (reading, writing and mathematics), memory issues, processing information and problem solving, attention / concentration deficits, organization issues, language and communication problems, sensory handicaps (vision and hearing), and motor limitations (fine and gross motor), including dysgraphia.

In terms of this article, we are going to focus on referrals that reflect students with learning disabilities and/or motor impairments and associated difficulties related to written language, oral communication, mathematics, reading, organization and content areas. The students may or may not need other supportive services or programs. (Note: Students with moderate to severe physical, cognitive, mobility and communication disabilities, notably requiring intensive related services, such as Occupational Therapy, Speech/Language therapy and Physical Therapy services may require additional support services, special education placements, equipment, adaptations, and / or specialized software).

Why consider Assistive Technology, such as computers in the first place?

Important points about the novelty of computers for students with learning and attention problems are that

1. Students often show increased interest and motivation when they get to sit at a computer station, especially students with attention issues. Just remember, that sometimes too much information coming into the senses from different modalities (for example, visual and auditory) can be counterproductive - as in a program being too stimulating and distracting in order to reach an educational goal. Sometimes you might have to turn off the volume, the music or abandon the program altogether. Perceptual problems with discrimination - either for images and letters or in hearing information or music background may make the program frustrating and inappropriate.
2. Computers don't usually give negative comments, criticize or provide straight failure feedback. They might not be as threatening to a student who is self-conscious about failure, in front of his/her peers or even adults.
3. Computers can be that great equalizer, when it comes to writing that composition or doing a research project.
4. Computers are a tool that can take away some of our children's weaknesses and make them more competitive in the classroom and in mastering the curriculum. But, this has to be learned

and the student has to be supported by educators, clinicians, parents, and administrators in order for it to work.

5. Computers are not the only solution and often there need to be other supports as part of an effective education plan. Only as students get more skilled with this tool do the benefits really make a difference. This is a process and it has to be committed to and learned.
6. Students are unique in their pattern of strengths and weaknesses, interests, learning style, and in what works and doesn't work for them.

What are some guidelines for establishing the need for assistive technology?

An analysis of curriculum objectives and the student's educational profile are part of the process. Questions related to assessment issues, educational concerns and accommodations need to be discussed, which may include evaluations and observations from different clinicians and teachers. Interviewing of the parent and student regarding school demands, including homework assignments are important concerns to address. In order to assess the students learning problems, one has to systematically examine all the issues. Once a complete profile of the student is established can we consider appropriate interventions, such as assistive technology and other supplementary aids and services. The following model presents guidelines and is intended as a place to start:

SETT Model The SETT Framework: A Collaborative Planning and Decision-making Tool - developed by Joy Zabala

For more on the SETT Framework see [Joy Zaballa's](#) web site.

Student

- What does the Student need to do?
- What are the Student's special needs?
- What are the Student's current abilities?

Environment

- What materials and equipment are currently available in the environment? What is the physical arrangement? Are there special concerns?
- What is the instructional arrangement? Are there likely to be changes?
- What supports are available to the student?
- What resources are available to the people supporting the student?

Task

- What activities take place in the environment?
- What activities support the student's curriculum?
- What are the critical elements of the activities?
- How might the activities be modified to accommodate the student's special needs?
- How might technology support the student's active participation in those activities?

Tool

- What strategies might be used to invite increased student performance?
- What no-tech, low-tech, and high-tech options should be considered when developing a system for a student with these needs and abilities doing these tasks in these environments?
- How might these tools be tried out with the student in the customary environments in which they will be used?

What are some examples of how Assistive Technology can support school demands and academic performance standards?

The need for students to be able to organize information is an important skill and can be accomplished through low tech (i.e., flowcharts and outlining techniques) to high tech solutions (tool software such as word processors or graphic organizers like Inspiration software). This is especially relevant to students with stronger visual organization skills where these strengths can be used to support lower language abilities. It is important to note that the underlying skills necessary to benefit from software programs need to be taught and monitored in terms of actual effective and efficient use of these products.

Assistive technology can provide support for note taking and assistance with writing. This involves, on the part of the student, the ability to input information, as well as to apply it to different uses and contexts (as in writing, reading or studying activities). Depending on the context issues and student expectations, there are many low tech to high tech solutions that assistive devices can offer. On a simple and practical level, the use of "buddy notes" or printed matter, as well as tape recorders, can supply a student with adequate notes. Books on tape (Recordings for the Blind and Dyslexic) could provide orally presented information covering books read or assigned for school. However, if the notes or written content are to become part of a project or studied from, and the student has significant difficulties in writing or reading (encoding or decoding deficits), the scanning in of information through OCR (optical character recognition) software offers many uses for a student with learning disabilities to utilize. For example, notes can become part of text which can be manipulated into additional writing, reading or study aids. The student with poor handwriting could utilize a keyboard or alternate input device to enter information and then edit it; the initial text could have been keyboarded in, but notes cannot always be copied within a limited time frame in class, thus making scanning a more efficient option. In addition, word processing programs (such as Microsoft Word or The Student Writing Center) offer additional writing supports through spell check, grammar check, macros, thesaurus, cut and paste and other features. Editing rough drafts and correcting them are more manageable in an electronic text context, and the printout never has erasures on it or is torn. The important issue is that these are examples of compensatory aids that allow students to be able to more effectively and successfully deal with school demands.

Secondly, if a student with reading issues has stronger auditory skills, he/she would benefit from having text read back to him/her (synthesized speech) via a talking text program or screen readers (i.e., Write: Outloud, Kurzweil 3000, E Reader, BookWise, WYNN by Arkenstone). If keyboarding and encoding skills are delayed, a student with relative strengths in language could utilize supplementary tool software in the area of word prediction (Co: Writer); visual and auditory presentations can be modified to support the level of student needs.

Assistive technology also encompasses tools such as calculators, hand held talking / spelling dictionaries and electronic equipment (personal digital assistants) that enables students to be more effective in keeping organized and doing assignments. Productivity tools can also be software-based and used with word processors (i.e., pull down menus for dictionaries), spreadsheets, databases and graphics software. Portable word processors, such as the Alphasmart, can be used in many contexts and then easily downloaded to a computer or printed.

Another important benefit of technology applies to the impact of electronic or digital information in obtaining and utilizing reference material. This is especially relevant for students whose learning disabilities impact on organization, integration of information, reading / comprehension and writing issues. The search of digital information via the internet, CD ROM , network and multimedia resources offers a format that can be modified to meet the needs for students unable to utilize more difficult text based resources. The ability to incorporate talking text features, view auditory and visual clips, import text and graphics files and use search functions, are examples of how a student can access information in a more friendlier format that offers more independent functioning and varied modes of presentation; granted, these search skills and fluency with technological innovations need to be learned, a student with learning differences will, with experience and training, have a "more level playing field".

Is the provision of Assistive Technology the best solution? Is more sophisticated or expensive equipment better?

Technology alone may not be the best solution, for it is only a tool that may level the classroom "playing field", and usually in conjunction with other interventions; the primary goal is to enable a student to be successful and competitive in the classroom. An education plan that incorporates multiple strategies (i.e., classroom modifications and accommodations, compensations, technology, remediation and related services) and problem-solving from key players increases the likelihood for positive results. Device abandonment, even of the most expensive equipment, may happen if all the factors are not considered. More is not always better. Too often, a computer and word processing software are given a student with writing difficulties and viewed as the ultimate solution. If this sometimes costly equipment is not effective, faulty technology team assessment and student shortcomings are often seen as the reason. This impacts on lowered teacher investment in the assistive technology, as well as a lowering of student performance expectations.

In a time of increasing academic standards, students with learning differences require a comprehensive educational plan that will support them. In order to be successful, appropriate assessments and observations need to be considered; a collaborative and integrative approach will result in an extensive educational plan that can aid the student. The student's current levels of functioning, curriculum demands being asked (in both the classroom and home environments), and knowledge of the continuum of supportive services (including assistive technology) are prerequisites in the consideration of what a student's individualized education plan will be. Direct involvement of the student, parents, teachers and other professionals, as well as established goals and timelines reflect an ongoing process in meeting the learning needs of students.

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